PH_A and PH_B provide voltage sufficient to conduct across the SCRs, the interrupter circuit **50** is conductive. Note that T**1** and T**2** are in parallel, but flipped. This is because the SCRs only work in one direction. A diode bridge B**2** is provided to rectify AC power to DC. Additionally, GFI protection is provided at TR**6** and TR**5**. FIG. **5**B is an alternate embodiment of the interrupter circuit of FIG. **5**A, further comprising a power transformer TR**3** in front of the bridge diode of the power supply.

[0073] Referring now also to FIG. **10**, is a schematic illustration of multiple devices **96-99** use an RF Mesh topology to communicate with a monitor **100**. Devices **96-99** use a 2.4 GHz wireless mesh network, which in the preferred embodiment is the ZigBee standard for communicating among the devices **96-99** and the devices **96-99** and a monitor **100**. As set forth above, the device **10** may take several forms, for example, power strips **98**, **99** and receptacles **96**, **97**.

[0074] In operation, the device **10** of the present embodiment is able to monitor multiple conditions, such as current, temperature, power, and change in VKN and conduct multiple tests. Once installed, the device **10** will have a unique identifier and then will conduct a baseline reading of the branch circuit that the device **10** governs. As set forth more fully below, the device **10** extracts phase shift information about a circuit from the reflection signal, characterizing and reporting a unitless but repeatable and predictable value, referred, to herein as the Vasqaez Kuttner Number ("VKN"). As used herein, "reflection" is understood to mean the response monitored on the same branch circuit through which the test signal was transmitted. This technique becomes a signature of the circuit under test and forwards the information to the server **200** through a monitor **100**.

[0075] The device **10** can be used for monitoring the branch circuit by automated repeated testing in order to detect changes indicative of faults, wiretaps, or the presence of unauthorized equipment. Additionally, the history of the condition, of a branch, circuit may be recorded.

[0076] The device **10** can create and store a generated VKN. The device **10** uses a vector network analyzer scheme that measures a reflection from an injected signal comprising a range of amplitudes and phases. The VKN is a unique number that is measured from the reflection, and once stored in the database **200**, becomes categorized as a representative signature to the configuration of the branch circuit under test and assigned to the device **10**. Typical network analyzers generate large amounts of data. The VKN is a succinct result that conveys the difference between a baseline reading and a possibly compromised circuit reading. The power conditioned apparatus measures the attenuation effects of branch circuits, then calculates the measured value.

[0077] The VKN is a unitless number that, once generated, becomes a representative signature of the configuration of the circuit under test. Since frequency pulses are attenuated by junctions, impedance, capacitance and other electrical/electronic devices in the circuit, each unique circuit configuration will attenuate one or more frequencies in a unique way. If ultimately plotted on a graph, the individual values that make up the VKN can be used to create a "fingerprint" of the circuit. Because two identical circuits would have the same measured values for all frequency pulses, identical circuits will cause the apparatus to generate the same VKN as well as the same "fingerprint" for both circuits.

[0078] Referring now to FIG. **11**, a schematic illustration of multiple monitors **100-190** is shown in communication with a server **200**. One or more monitors **100-190** are assigned to a single customer or location.

[0079] Referring now to FIG. **12**, an exemplary data flow chart is shown. Information flows from the intelligent switchable device **10**, also known as a reporting device **10**, to a monitor **100**, and from the monitor **100** to a server **200**.

[0080] Referring now to FIG. **13**, a branch circuit monitoring circuit **220** for determining whether the branch circuit is in use is shown. The branch circuit monitoring circuit **220** includes a plurality of arrays **221**, **222**, **223**, **224** for testing a branch circuit condition are interconnected to the device **10**. Each of the arrays **221-224** are electrically isolated from the lines **5**, and each of the arrays **221-224** are preferably an optoisolator array.

[0081] Once the branch circuit state is known, the device **10** can be commanded to execute one of several test types. The device **10** can determine if a branch circuit is energized and immediately abort a test in progress if necessary. Alternatively, if a test is scheduled, the test can be suspended until the branch circuit is available if the test type would interfere with usage. Furthermore, a test type can be executed that does not interfere with the power usage and does not require the line to be dry (not in use) to execute the test. Finally, the server **200** may command the test to be executed during nonpeak hours.

[0082] Referring now to FIG. **14**, a test generation circuit **230** having a controller **231** is shown. The controller **231** has a CPU (not shown) and memory storage (not shown) adapted to receive signals and transmit instructions. The controller **231** receives the digital signal indicative of branch circuit state for each branch circuit from the A/D **225**, and, based on the state of each branch circuit, produces instructions to further evaluate the branch circuit, as discussed further below. The controller **231** produces a digital signal to command a digital to analog converter "DAC" **232** to produce an analog signal, identified as STIM_O, to be injected into the line **5**.

[0083] In the preferred embodiment, the instructions executed by the controller **231** includes instructions to transmit a test signal to at least one user selectable branch circuit, compare a test signal response measured from at least one user selectable branch circuit to a baseline response, report a change in branch circuit state when the difference between a test signal response and a baseline signal response exceeds a threshold, and issue a countermeasure based upon countermeasure settings.

[0084] Referring still to FIG. **14**, in the preferred embodiment, a power amplifier (not shown) provides additional drive capability to the test signal as generated by the test generation circuit **230**. The controller **231** is capable of commanding any desired wave form, including a square wave, sinusoidal, triangular, or the like. The controller **231** is programmable to output a user specified test signal, however, it is the intent of the present embodiment to provide a test signal having a frequency above 50 KHz. In one embodiment, the test signal, STIM_O, is a single frequency sine wave having a frequency above 50 KHz.

[0085] The test generation circuit **230** forms part of a stimulus response module which is user-configured. A user may select a test with an option to select a test compatible with an IN-USE state (Type 3) since a Type 1 or Type 2 test would not generally be available. However, the system may